

Biodiesel and the Future of Biofuels



Biodiesel is a simple and effective alternative to Petroleum Diesel

- ✓ **Runs in Diesel Engines**
- ✓ **Satisfies Mandates**
- ✓ **Reduces Emissions**
- ✓ **Reduces Oil Dependence**
- ✓ **Meets 2006 Standards**
- ✓ **Stimulates Our Economy**



Biodiesel Runs in Any Distillate Application Without Modification

- Common blends to 20% (B20)
- Does not Void Warranty
- Typical Costs \$.01 per 1%
- Pour N Go



Rudolph Diesel

Biodiesel Performance: Better than Petroleum Diesel Fuel

- High Cetane- exceeds premium diesel std.
- High lubricity-1% makes ULSD > LSD

- Fuel efficiency- Life

- (content- power



Status of Biodiesel 2004

- 400,000,000 Gallons Market Worldwide
- 25,000,000 Gallons US Market
- Fastest Growing Alt Fuel 02, 03, 04 (US DOE)
- Over 100 million road miles of use (US)
- World Energy DOE 2004 Co. of Year



energy solutions, pure and simple

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- 50+% Market Share US
 - 5 Production Plants US / 2 Europe
 - 6 Sales Offices US
 - Diversified Production and Feedstock Capabilities
 - Nation-wide local distribution network
 - Over 40 US Distribution Locations
 - Liscensed Fuel Seller in over 30 states
 - Started in 1994
 - Backed By Gulf Oil Since 1998



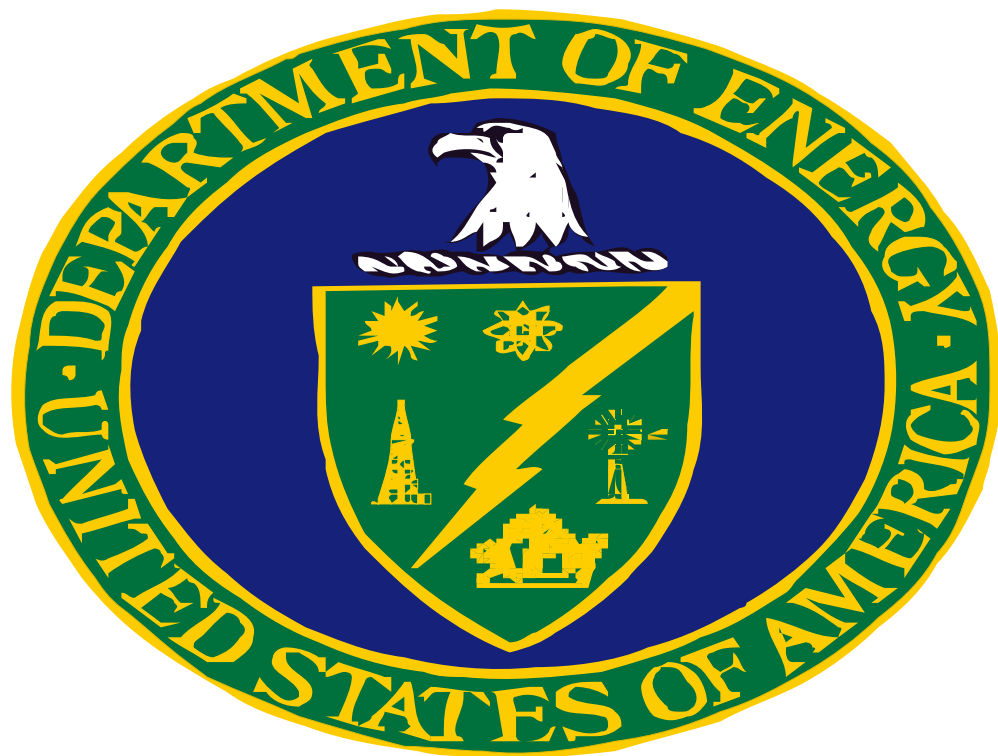
Why Biodiesel?



Public Policy Case for Biodiesel

- **National Security**: Import Less Petroleum
- **Environment**: Lower Greenhouse and Local Emissions
- **Public Health**: Less Toxic /& Biodegradable
- **Operations**: ULSD Performance Enhancer
- **Economics**: CBO: save \$10 million annually
- **Economy**: US Jobs and Ag Support





Opportunity to Reduce Petroleum Dependence

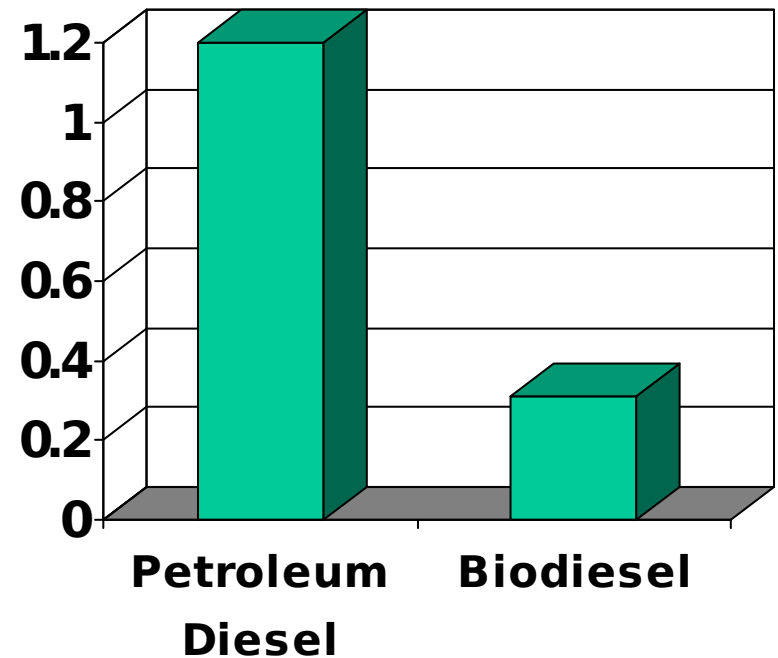
- Displace 10% of US diesel
- Reduce imports from 70 percent to 65 percent by 2016



Truly Renewable Power Source

- Biodiesel yields 3.2 units of fuel energy for every unit of fossil fuel consumed in its life cycle.
- Petroleum diesel yields 0.83 units of fuel energy per unit of fossil energy consumed.

MJ Fossil Used per MJ Fuel

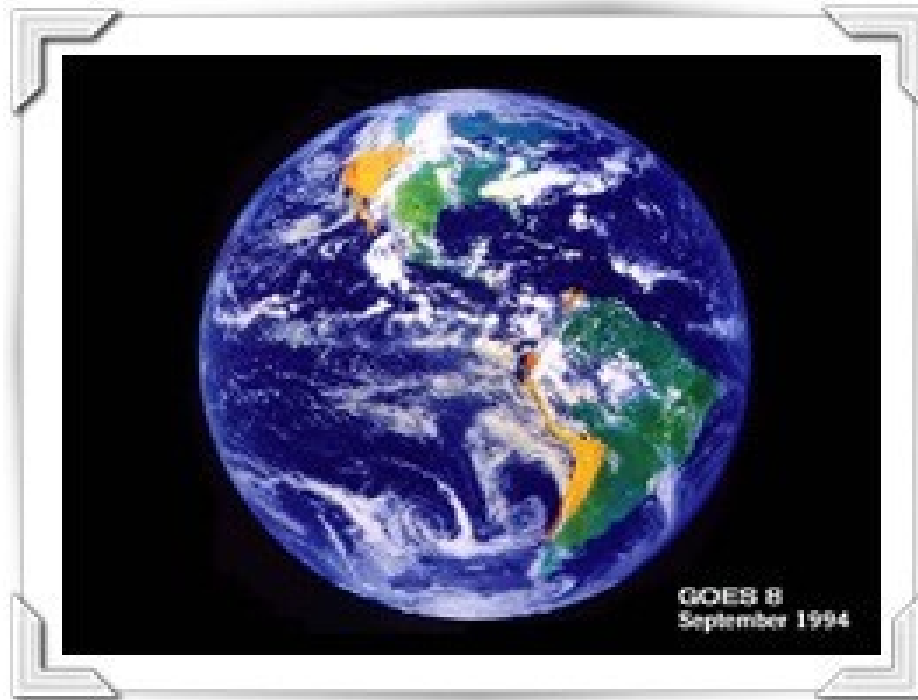


Regulatory Compliance

- Easy In / Easy Out Compliance
- EPA Act:
 - 2250 gallons of B20 = 1 vehicle (\$563 at .25)
- Limited to 50 percent of compliance
- Executive Order 13149
 - 20 percent petroleum reduction

Slow Down Global Warming

- 78% GHG reduction (US DOE)
- 16% reduction for B20 blends



Stimulate the US Farm Economy

- Soybean oil demand increase from 51 million bushels to 318 million bushel (USDA)
- \$7.8 billion reduction in direct payments to farmers
- \$63.4 billion improvement in US trade deficit
- \$100 billion increase in net farm income



Meet EPA 2006 Standards for Clean Diesel...

- Biodiesel at 0-1 ppm sulfur.
- Specify 15 ppm standard for blend
- Zero aromatics



...With Improved Lubricity

Lubricant	<u>HFFR</u> (microns)
None	536
1% Biodiesel	321
Additive 1	338
Additive 2	398
Additive 3	343
Additive 4	348
Additive 5	515



Emissions Reductions

B20 emissions reductions compared to petroleum diesel:

- Carbon monoxide -16%
- Unburned hydrocarbons -21%
- Particulate matter -10%
- Sulfates -20%
- NPAH -50%
- Mutagenicity -20%

Public Health Risk Reduction

- NO** pronounced toxicity at any level (B100)
- **NO** mortality or clinical abnormality
- **NO** neurotoxic or internal pathologic response
- **NO** adverse effect on fertility and reproduction
- Decreased mutagenicity activity in living organisms (US EPA)

Pure Biodiesel is Safer to, Burn and Spill

- B100 reduces toxicity to marine life by 20x
- Flashpoint over 300 F
- Less Toxic than Table Salt
- B20 biodegrades twice as fast as petroleum diesel



Who is Already Using Biodiesel?

Sensitive Locations

- Aspen
- Yellowstone NP
- Northstar at Tahoe
- Glacier NP
- Breckenridge
- Channel Islands



Who is Already Using Biodiesel?

Utility Fleets

- Commonwealth Edison
- San Diego Gas & Electric
- Florida Power & Light
- Madison Gas & Electric
- Alabama Power
- Georgia Power
- Centerpoint Energy

Who is Already Using Biodiesel?

Government Fleets

- Transit of Northern Kentucky
- The US Post Office
- US Dept. of Agriculture
- North Carolina, Ohio, Michigan DOT's
- The State of Alabama, Oregon
- Las Vegas fleets- city, school, etc.
- City of Berkeley

Who is Already Using Biodiesel?

Military Fleets

- Eglin Air Force Base
- Peterson Air Force Base
- Camp Pendleton USMC
- The US Navy
- Tinker Air Force Base
- Manchester Fuel Depot

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